

IN THE CLAIMS:

1. (Previously Amended) A diagnostics system comprising:

a flexible patch having an adhesive portion adapted to stick to the skin of a human subject;

a radio frequency identification tag (RFID);

a sensor module integrated with said patch, said flexible patch further having an antenna, an RFID chip, and at least one sensor associated with a unique identification code, said RFID and sensor module responding to a biological stimulus by wirelessly transmitting through the use of said antenna signals that correspond to said biological stimulus;

an autonomous wireless reader with a unique identification code for communication with said RFID tag and sensor module, said RFID reader being adapted to communicate information over a wireless network; and

wherein said biological stimulus is radiation.

2. (Original) A system according to claim 1, wherein a substantial portion of said RFID tag and sensor module is integrated onto a substrate disk.

3. (Cancelled)

4. (Cancelled)

5. (Original) A system according to claim 1, wherein said RFID tag and sensor module comprises: a sensor interface having an analog to digital converter coupled to said at least one sensor; and

a controller communicative with said sensor interface, said controller having a memory with a sensor data table being adapted to analyze said at least one sensor within said RFID tag and sensor module.

6. (Original) A system according to claim 5, wherein said controller stores a sensor identification number in said sensor data table.

7. (Cancelled)

8. (Cancelled)

9. (Original) A system according to claim 1, wherein said RFID reader is selected from the group consisting of a cellular telephone, a personal digital assistant, a beeper, and a computer.

10. (Cancelled)

11. (Original) A system according to claim 1, wherein said RFID tag and sensor module further comprises a power unit adapted to stabilize voltage within said RFID tag and sensor module.

12. (Cancelled)

13. (Original) A system according to claim 1, wherein said RFID tag and sensor module is formed as an integrated circuit.

14. (Cancelled)

15. (Cancelled)

16. (Cancelled)

17. (Cancelled)

18. (Cancelled)

19. (Original) A system according to claim 1, wherein said patch is disposable.

20. (Previously Presented) A system according to claim 1, wherein said RFID tag further includes a power generation module that powers said RFID tag.

21. (Cancelled)

22. (Cancelled)

23. (Cancelled)

24. (Cancelled)

25. (Cancelled)

26. (Cancelled)

27. (Cancelled)

28. (Previously Amended) A system according to claim 1, wherein said network is a wireless network that communicates through the use of a communication protocol selected from the group consisting of Bluetooth, Wi-Fi, Broadband, WLAN, and 3G.

29. (Currently Amended) A system according to claim [25] 1, wherein said RFID reader is a cellular telephone.

30. (Withdrawn) A personal wireless communications device for communicating with a radio frequency identification (RFID) tag and sensor module, comprising:
a multi protocol RFID reader that is compatible with and adapted to activate said RFID tag and sensor module;

a microprocessor communicative with said RFID reader and adapted to analyze and store data read by said RFID reader; and

at least one antenna coupled to said microprocessor for transmitting and receiving data from said RFID reader, said microprocessor and said RFID tag and sensor module, said antenna being adapted to transmit and receive data from an external device through the use of a network.

31. (Withdrawn) A device according to claim 30, wherein said multi protocol RFID reader, said microprocessor, and said antenna, are integrated into a cellular telephone.

32. (Withdrawn) A device according to claim 30, wherein said microprocessor is adapted to determine the location of said RFID tag.

33. (Withdrawn) A device according to claim 30, wherein said multi protocol RFID reader, said microprocessor, and said antenna, are integrated into a personal digital assistant (PDA).

34. (Withdrawn) A device according to claim 30, wherein said external device is a remote storage/data processing unit adapted to analyze, store, and transmit data received from said antenna.

35. (Cancelled)

36. (Cancelled)

37. (Cancelled)

38. (Withdrawn) An immunoassay test strip system for use in conducting diagnostic measurements comprising:

a substrate that forms a test strip;

at least one test area located on said substrate for capturing antigens; and

a radio frequency identification (RFID) tag and sensor module integrated with said substrate, said RFID tag and sensor module being adapted to sense and transmit signals that correspond to the antigens captured by said at least one test area.

39. (Withdrawn) An immunoassay test strip according to claim 38, further comprising a wireless reader adapted to receive and process signals from said RFID tag and sensor module through the use of multiple protocols.

40. (Withdrawn) An immunoassay test strip according to claim 39, wherein said wireless reader is a cellular telephone.

41. (Withdrawn) An immunoassay test strip according to claim 38, wherein said RFID tag and sensor module includes a temperature sensor.

42. (Withdrawn) An immunoassay test strip according to claim 38, wherein said test strip is disposable.

43. (Withdrawn) An immunoassay test strip of claim 38, wherein said test strip is adapted to perform quantitative protein measurements.

44. (Withdrawn) An immunoassay test strip of claim 38, wherein said test strip is adapted to perform quantitative biomarker measurements.

45. (Withdrawn) An immunoassay test strip of claim 38, wherein said test strip forms a disease-specific sensor device.

46. (Withdrawn) An immunoassay test strip of claim 38, wherein said test strip is adapted to perform pre-disease specific tests.

47. (Withdrawn) An immunoassay test strip of claim 38, being adapted to perform drug toxicity tests.

48. (Withdrawn) A method of manufacturing a pathogen-specific radio frequency identification (RFID) tag and sensor module, comprising the steps of:

providing a substrate;

printing conductive leads on said substrate wherein said conductive leads define a sensor area;

printing a protective cap doped with a material that is sensitive to pathogen-specific enzymatic action within said sensor area;

printing an antenna on said substrate; and

integrating an RFID tag and sensor module with said substrate.

49. (Withdrawn) A multi-function personal wireless communications device capable of wireless diagnostics through communication with at least one radio frequency (RF) addressable sensor having a radio frequency identification tag and sensor unit, comprising:

a user interface for receiving an input from a user and transmitting signals corresponding to said input;

a multi-protocol RF reader adapted to receive said input signal, said RF reader adapted to retrieve a unique identification of the RF addressable sensor and downloading software that enables reading and analyses of the RF addressable sensor;

a controller having memory storage and being adapted to process and transmit signals received by said RF reader; and

at least one antenna configured to receive signals from the RF addressable sensor and transmit signals from said controller and said RF reader.

50. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein said communications device is adapted to geolocate the at least one RF addressable sensor.

51. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein the wireless communications device is a cellular telephone.

52. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein said multi-protocol RF reader downloads software that enables reading and analyses of the RF addressable sensor from a remote database.

53. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein the device is a PDA.

54. (Withdrawn) The multi-function personal wireless communications device of claim 49, wherein said user interface includes a preconfigured button for initiating a read of the RF addressable sensors.

55. (Withdrawn) The multi-function personal wireless communications device of claim 49, further comprising a means for receiving sensor processing information over the communications network.

56. (Withdrawn) The multi-function personal wireless communications device of claim 49, further comprising a means for connecting a removable sensor module; wherein said removable sensor module provides at least one sensor with a means for monitoring a given health function or for detecting the presence of a harmful agent in the atmosphere.

57. (Withdrawn) The multi-function personal wireless communications device of claim 56, wherein the controller, network communications means, RF addressable sensor communication means, removable sensor means and user interfaces are integrated onto a single electronic chip.

58. (Withdrawn) The multi-function personal wireless communications device of claim 57, wherein said single electronic chip is a 3G chipset.

59. (Withdrawn) A Lab-on-a-Chip microfluidics sensor for conducting rapid diagnostic measurements that are readable directly with a remote wireless RF reader comprising:

conductive leads that enable transmission of signals;

a Lab-on-a-Chip substrate having at least one test area integrated therein and a sensor interface that couples said conductive leads to said test area;

a temperature module integrated with said substrate and adapted to generate signals that correspond to temperature;

an addressable radio frequency (RF) chip having a controller, an RF power source with a voltage stabilization circuit, and a communication interface, said RF chip receiving signals from said conductive leads and said temperature module, said RF chip being adapted to process said conductive lead signals, said temperature module signals and signals from the wireless RF reader; and

at least one antenna adapted to receive signals from the wireless RF reader and said RF chip and transmit signals from said Lab-on-a-Chip microfluidics sensor.

60. (Withdrawn) The Lab-on-a-Chip device of claim 59, wherein the microfluidics sensor is capable of quantitative protein measurements that are readable directly with the wireless RF reader.

61. (Withdrawn) The Lab-on-a-Chip device of claim 59, wherein the microfluidics sensor is capable of quantitative biomarker measurements that are readable directly with the wireless RF reader.

62. (Withdrawn) The Lab-on-a-Chip device of claim 59, wherein the microfluidics sensor is adapted to perform DNA tests that are readable directly with the wireless RF reader.

63. (Withdrawn) An immunoassay test strip for conducting an instant diagnostics test using a wireless reader device, wherein the wireless reader device is adapted to communicate over a wireless network, the immunoassay test strip comprising:

at least one test area with an integrated radio frequency chip that is communicative with the wireless device and that provides power to said test area; and

wherein said test area is an electro-immunoassay for measuring the presence and quantity of a biological molecule.

64. (Withdrawn) An immunoassay test strip according to claim 63, wherein said radio frequency chip is selected from the group consisting of an RFID chip, a Bluetooth chip, a Zigbee chip or an IEEE 1073 chip.

65. (Previously Presented) A radio frequency (RF) addressable diagnostic sensor unit comprising:

at least one sensor element;

at least one reference sensor element;

a unique identification ID number;

a sensor interface having an analog to digital converter coupled to the at least one sensor and reference sensor element;

at least one antenna;

a substrate;

an RF power and communication interface coupled to the at least one antenna and sensor interface;

a controller coupled to the RF power and communications interface and the sensor interface; and

a memory coupled to the controller and the sensor interface;

wherein the RF addressable sensor communicates with a remote wireless device, said wireless device having multiple wireless communication means, geolocation means and a

unique ID, whereby said wireless device is coupled to at least one communications network linked to at least one remote server; and

wherein the wireless device communicates with the RF addressable sensor interface to obtain the ID and sensor data;

wherein the remote server authenticates said unique sensor ID associated with said unique wireless device ID and communicates to said wireless device processed information relating to said sensor data or to first download software related to the unique sensor ID, thereby allowing said wireless device to interpret said sensor anywhere worldwide.

66. (Currently Amended) The system according to claim 65 wherein said ~~personal~~ wireless device is a cell phone.

67. (Previously Presented) The system according to claim 65 wherein said sensor unit is integrated into a disposable wireless skin patch for diagnostic applications.

68. (Previously Presented) The system according to claim 65 wherein said sensor is integrated into a disposable immunoassay.

69. (Previously Presented) The system according to claim 65 wherein said sensor is a chemical sensor.

70. (Previously Presented) The system according to claim 65 wherein said sensor is a radiation sensor.

71. (Previously Presented) The system according to claim 65 wherein said sensor is a MEMS sensor.

72. (Previously Presented) The system according to claim 65 wherein the unit includes a combination of chemical, MEMS and other sensors.

73. (Previously Presented) The system according to claim 65 wherein the system further includes a GPS means for geolocating said system.

74. (Previously Presented) The system according to claim 65 further including a non-GPS geolocation means for geolocating said system.

75. (Previously Presented) A stand-alone wireless diagnostic system comprising:

a non-invasive disposable flexible patch having an adhesive portion and adapted to be positioned on a skin surface of a human subject, said patch having a built-in temperature sensor and means to sense at least one additional medical condition from said human subject;

a radio frequency identification (RFID) chip with a unique ID and sensor module integrated with said patch and having at least one antenna, wherein said RFID chip and sensor module wirelessly transmit, through the use of said antenna, signals that correspond to said medical condition in said subject to a wireless cell phone reader adapted to communicate with

said RFID chip and sensor module, said cell phone reader being adapted to communicate over a wireless network through the use of multiple communication protocols.

76. (Previously Presented) The system in claim 75 wherein the said medical condition is diabetes.

77. (Previously Presented) The system in claim 75 wherein the said medical condition is a skin infection.

78. (Previously Presented) The system in claim 75 wherein the said medical condition is a heart condition.

79. (Previously Presented) The system in claim 75 wherein the said medical condition is a combination of fever and a skin infection.

80. (Previously Presented) The system according to claim 75 wherein said wireless cell phone reader has a unique ID.

81. (Previously Presented) The system according to claim 75 wherein the RF signals from the cell phone include Bluetooth.

82. (Previously Presented) The system according to claim 75 wherein said chip is a Zigbee chip.

83. (Currently Amended) A networkable personal wireless medical management system comprising:

a personal wireless reader device with a sensor module and an internal microprocessor, a wireless RF communication means compatible with a public wireless network, at least one additional reader for communicating with an external wireless device and a geolocation means;

a remote data storage system and server accessible via the public wireless network compatible via at least one protocol means included in said personal wireless device;

a disposable minimally invasive wireless diagnostic skin patch with a unique ID, a temperature sensor, a communications interface and at least one additional sensor to be applied on the surface of the skin to measure a condition in an individual, said at least one additional sensor compatible with at least one of the readers of said personal wireless device;

wherein the personal wireless device first checks the unique ID of said wireless skin patch, and if said ID is not recognized then the wireless device retrieves relevant information and software from said remote server via said public wireless network, wherein medical data of said second at least one additional sensor are then transferred wirelessly from said diagnostic skin patch to the personal wireless device, and the said internal microprocessor of said personal wireless device analyzes said medical condition, then after analization of said medical condition in a second stage said microprocessor sends said data via an RF transmission via said wireless network.

84. (Previously Presented) The system in claim 83 wherein one of the readers of said personal wireless reader device is an RFID radio.

85. (Previously Presented) The system in claim 83 wherein one of the readers of said personal wireless reader device is a Bluetooth radio.

86. (Previously Presented) The system recited in claim 83 wherein the combination of RFID and Bluetooth are used in said personal wireless device for said medical management system.

87. (Previously Presented) The system recited in claim 83 wherein the personal wireless reader device is a cell phone.

88. (Previously Presented) The system recited in claim 83 wherein the personal wireless reader device is a PDA.

89. (Previously Presented) The system recited in claim 83 wherein the personal wireless reader device is a wireless laptop.

90. (Currently Amended) An addressable quantitative passive radio frequency addressable skin patch comprising:

a skin patch having one or more sensor elements at least one sensor with a unique sensor tag ID;

a sensor interface having an analog to digital converter coupled to the said one or more sensor elements;

at least one antenna;

an RF power and communication interface coupled to the at least one antenna and the sensor interface;

a controller coupled to the RF power and communications interface and the sensor interface, said controller receiving sensor data from said at least one sensor and generating processed information therefrom; and

a memory coupled to the controller and the sensor interface, wherein the memory is configured to store a unique tag identification ID number;

wherein the RF addressable skin patch communicates with a wireless device with a unique wireless device ID that is coupled to a communications network linked to at least one remote server; and

wherein the wireless device communicates with the RF addressable skin patch to obtain sensor data for transmission over the communications network;

wherein the remote server authenticates remotely said unique sensor tag ID and said unique wireless device ID and communicates to said wireless device said processed information relating to said sensor data;

at least one external printable chemical sensor and one external reference sensor, wherein said patch sensors and said unique sensor tag ID are directly readable with a personal wireless device coupled to a communications network linked to at least one remote server and comprising multiple radios, geolocation means and an interface, and a means to store and relay to said remote server results of said chemical sensors on said patch.

91. (Previously Presented) The skin patch according to claim 90 further including a MEMS sensor and a battery.

92. (Previously Presented) The skin patch according to claim 90 further including at least one radiation sensor.

93. (Currently Amended) The skin patch in claim 90 whereby multiple chemical sensors are used to warn ~~the bearer~~ a user of said patch of an impending medical condition.